Volume 43 January–June 1981

# Philosophical Magazine

First Published in 1798

Physics of Condensed Matter

A Defects and Mechanical Properties

B Electronic, Optical and Magnetic Properties

EUROPHYSICS JOURNAL

*Published by*
**Taylor & Francis Ltd,** 4 John Street, London WC1N 2ET

# PHILOSOPHICAL MAGAZINE

*Editor:*

Professor E. A. DAVIS

*Associate Editors:*

Professor J. E. ENDERBY

Professor A. J. FORTY

Dr. P. M. HAZZLEDINE

*E.P.S. Editorial Committee:*

Professor J. FRIEDEL (Paris)

Professor A. SEEGER (Stuttgart)

Professor U. VALDRÈ (Bologna)

*Consultant Editor:*

Professor Sir NEVILL MOTT

*Book Review Editor:*

Dr. E. MARSEGLIA

**Subscription Information**

*USA, Canada and Mexico* (air freight): annual subscription (payable in advance), $470·00; per part $42·00 (surface post paid). Air freighted to the USA and mailed from Jamaica, New York, by Publications Expediting Inc., 200 Meacham Avenue, Elmont, New York 11003. Second class postage paid at Jamaica, New York. US subscribers should send order and cheque (in favour of Taylor & Francis Ltd) to Account 04 810 879 Bankers Trust Company, P.O. Box 9137, Church Street Station, New York, N.Y. 10049.

*Japan* (accelerated surface post): apply to exclusive agents, Kinokuniya Company Ltd, Odakyu West-Shinjuku Building, 47–1 Hatsudai 1-chome, Shibuya-ku, Tokyo 151. Telex 2322535.

*FR Germany* (surface post): annual subscription (payable in advance), DM 724·00; per part DM 66·00. Subscribers in FR Germany should send order and cheque (in favour of Taylor & Francis Ltd) to Account No. 073/6686, Deutsche Bank AG, BLZ 500 700 10, Postfach 2623, Rossmarkt 18, 6000 Frankfurt/Main 1.

*UK and the rest of the world* (surface post; accelerated surface post to Australasia; air freight to India): annual subscription (payable in advance), £165·00; per part £15·00 (surface post paid).

Published monthly by Taylor & Francis Ltd, 4 John Street, London WC1N 2ET, UK. Telex 858540.

Printed by Taylor & Francis (Printers) Ltd, Rankine Road, Basingstoke, Hampshire RG24 0PR, UK.

© 1981 Taylor & Francis Ltd.

ISSN Nos. (A) 0141–8610; (B) 0141–8637

# CONTENTS OF VOL. 43 Nos. 1–6

## NUMBER 1—JANUARY

### PART A


PAGE

**Editorial**

**Dislocation–inclusion interactions during creep**
By B. BURTON ..... 1

**Influence du gravage des joints de grains sur la vitesse de fluage diffusion des fils à structure bambou et la détermination corrélative de la tension superficielle**
Par P. RÉGNIER et M.-F. FELSEN ..... 11

**Fluage de fils de cuivre à structure bambou dans et hors du domaine de contrainte où la diffusion contrôle la vitesse de déformation**
Par M.-F. FELSEN et P. RÉGNIER ..... 29

**Void formation in electron-irradiated Ni–12 at. % Ti alloys with modulated structures**
By K. SAITO ..... 43

**Radiation-induced creep in single crystals of face-centred-cubic materials**
By W. G. WOLFER ..... 61

**Significance of fluctuations in the evolution of voids during irradiation**
By K. KRISHAN ..... 71

**Sliding at twin boundaries during high-temperature creep**
By G. WIRMARK, J.-O. NILSSON and G. L. DUNLOP ..... 93

**Single atom sputtering events. Direct observation of near-surface depleted zones in ion-irradiated tungsten**
By M. I. CURRENT, CHING-YEU WEI and D. N. SEIDMAN ..... 103

**Black–white contrast on transmission electron microscope images of small dislocation loops in elastically anisotropic crystals**
M. WILKENS and H. O. K. KIRCHNER ..... 139

**'*In situ*' straining in the HVEM of neutron-irradiated copper crystals**
By E. JOHNSON and P. B. HIRSCH ..... 157

**A possible model for corrosion pitting and tunnelling in noble-metal alloys**
By A. J. FORTY and G. ROWLANDS ..... 171

**Partial secondary dislocations in germanium grain boundaries. I. Periodic network in a $\Sigma=5$ coincidence boundary**
By J.-J. BACMANN, G. SILVESTRE and M. PETIT ..... 189

**Partial secondary dislocations in germanium grain boundaries. II. Reactions with external dislocations in a $\Sigma=25$ coincidence boundary**
By W. BOLLMANN, G. SILVESTRE and J.-J. BACMANN ..... 201

**Anisotropic post-yielding behaviour of directionally solidified, single-grained eutectics**
By K. WAKASHIMA and T. H. COURTNEY ..... 213

**Diffusion, correlation, and percolation in a random alloy**
By G. E. MURCH and S. J. ROTHMAN ..... 229

**Dislocation damping in $Cu_3Au$ alloys**
By K. MIURA, K. SHIMANO and T. YOKOYAMA ..... 239

## PART B

Editorial PAGE

**Screw-dislocation motion in b.c.c. transition metals. Model calculation using a tight-binding-type electronic theory**
By A. SATO and K. MASUDA ..... 1

**Calculation of core structure and core energy of $\frac{1}{2}\langle 111\rangle\{110\}$ and $\frac{1}{2}\langle 111\rangle\{112\}$ edge dislocations in a b.c.c. transition metal: moments approach**
By K. MASUDA, K. KOBAYASHI, A. SATO and T. MORI ..... 19

**A cluster model for amorphous antiferromagnetism**
By N.-I. FRANZÉN and K.-F. BERGGREN ..... 29

**Preparation of amorphous silicon by sputtering in silane**
By J. C. ANDERSON, K.-W. KIM and E. SEFERIADES ..... 51

**Jahn–Teller interactions at $Cr^{2+}$ in GaAs**
By J. E. LOWTHER ..... 61

**Electron–phonon interaction in lead and lead–indium alloys under pressure**
By V. M. SVISTUNOV, O. I. CHERNYAK, M. A. BELOGOLOVSKII and A. I. D'YACHENKO ..... 75

**Analysis of field-effect-conductance measurements on amorphous semiconductors**
By M. J. POWELL ..... 93

**Small-polaron absorption in $W_xMo_{1-x}O_3$**
By E. SALJE and G. HOPPMANN ..... 105

**Electron states in heavily doped semiconductors**
By B. E. SERNELIUS and K.-F. BERGGREN ..... 115

**E.S.R. in doped CVD amorphous silicon films**
By S. HASEGAWA, T. KASAJIMA and T. SHIMIZU ..... 149

**Correspondence:**

**A new effect in transport near the mobility edge**
By T. LUKES ..... 157

**X-ray measurement of charge-density anisotropy in $Fe_{0.70}Ni_{0.30}$ and $Fe_{0.67}Cr_{0.24}$ alloys**
By R. CANNATA and G. MAZZONE ..... 161

**Carrier scattering by ionized impurities with non-linear screening charge in semiconductors**
By D. CHATTOPADHYAY ..... 165

**An alternative method of preparing hydrogen-doped evaporated amorphous silicon. Preliminary report**
By P. DELLAFERA, R. LABUSCH and H. H. ROSCHER ..... 169

**Dependence of the hopping-conductivity exponent on band shape for two-dimensional impurity bands**
By S. R. AL-SADEE, P. N. BUTCHER and K. J. HAYDEN ..... 173

**Impurity conduction and the minimum metallic conductivity in n-type InSb**
By G. BISKUPSKI, H. DUBOIS and D. FERRE ..... 177

**Book reviews** ..... 183

## NUMBER 2—FEBRUARY

### PART A

PAGE

**Diffusion kinetics and isotope effects for atomic migration via divacancies and triple defects in the CsCl (B2) structure**
By H. Bakker, N. A. Stolwijk and M. A. Hoetjes-Eijkel ..... 251

**Defect structure and ionic conductivity in lithium nitride**
By J. R. Walker and C. R. A. Catlow ..... 265

**Self-diffusion of $^{48}V$ in vanadium–zirconium alloy**
By J. Pelleg ..... 273

**Creep and cavity growth under multiaxial stresses**
By G. W. Greenwood ..... 281

**The volume of formation of Schottky defects in ionic crystals**
By A. B. Lidiard ..... 291

**The volume of formation of defects in ionic crystals**
By M. J. Gillan ..... 301

**An atomistic calculation of extended planar defects in ionic crystals. Application to stacking faults in the alkali halides**
By P. W. Tasker and T. J. Bullough ..... 313

**Foil thickness measurements from convergent-beam diffraction patterns**
By S. M. Allen ..... 325

**Theoretical free energies for superplasticity and dislocation creep. The origin of the high ductility of superplastic materials**
By J. H. Gittus ..... 337

**Metastable Au–Si alloy formation induced by ion-beam interface mixing**
By B. Y. Tsaur and J. W. Mayer ..... 345

**High-temperature isothermal internal friction of copper and copper–aluminium solid solutions between $10^{-4}$ and 10 Hz**
By R. J. Gaboriaud, J. Woirgard, M. Gerland and A. Riviere ..... 363

**Internal friction in hydrogen-charged aluminium alloys**
By M. Leger and G. R. Piercy ..... 377

**A dilatometric study of vacancy mobility in the intermetallic compound CoGa**
By A. H. van Ommen and J. de Miranda ..... 387

**Analytical description of the electron microscopic diffraction contrast of lattice defects in the two-beam case**
By K.-H. Katerbau ..... 409

**Self-diffusion in concentrated Fe–Al and Fe–Si alloys**
By V. S. Raghunathan and B. D. Sharma ..... 427

PAGE

**Electron diffraction and microscopy studies of the structure of grain boundaries in silicon**
By C. B. CARTER, H. FÖLL, D. G. AST and S. L. SASS ..... 441

**Neutron diffraction topographic observation of the {100}-layer substructure in a Cu–5% Ge single crystal**
By H. TOMIMITSU ..... 469

**Correspondence:**

**Direct observation of partial dislocation motion in $II_b$–$VI_b$ compounds**
By K. SUZUKI, M. ICHIHARA, K. NAKAGAWA, K. MAEDA, S. TAKEUCHI and H. IWANAGA ..... 499

PART B

**Excitations and metastability in amorphous semiconductors**
By D. C. LICCIARDELLO, D. L. STEIN and F. D. M. HALDANE ..... 189

**The electronic structure of weak, random, two- and three-dimensional potentials**
By R. HAYDOCK ..... 203

**The mobility of a quantum particle in a three-dimensional random potential**
By W. GÖTZE ..... 219

**The exceptional properties of mercury and other divalent metals**
By A. R. MIEDEMA and J. W. F. DORLEIJN ..... 251

**Absence of band-gap surface states on clean amorphous silicon**
By J. N. MILLER, I. LINDAU and W. E. SPICER ..... 273

**Chemical bonding states in the amorphous $Si_xC_{1-x}$: H system studied by X-ray photoemission spectroscopy and infrared absorption spectra**
By Y. KATAYAMA, K. USAMI and T. SHIMADA ..... 283

**Electroabsorption in ZnSe cubic crystals**
By J. DAUNAY, J. BAILLOU, J. DAUNAY and P. BUGNET ..... 295

**The derivation of force constant information from experimental data**
By M. A. BALL and S. HAJAIG ..... 309

**Optical activity and the Faraday effect at X-ray frequencies**
By M. HART and A. R. D. RODRIGUES ..... 321

**Nucleation theory of threshold switching in vanadate–glass devices**
By E. GATTEF and Y. DIMITRIEV ..... 333

**Dependence of electrical resistivity on the degree of short range order in a nickel–copper alloy**
By W. WAGNER, R. POERSCHKE and H. WOLLENBERGER ..... 345

**Effect of nitrogen doping on glow-discharge amorphous silicon films**
By S. M. PIETRUSZKO, K. L. NARASIMHAN and S. GUHA ..... 357

PAGE

**Correspondence:**

**Molecular dynamics simulation of silicon dioxide glass**
By S. K. MITRA, M. AMINI, D. FINCHAM and R. W. HOCKNEY ..... 365

**The influence of the substitution of $^{16}O$ by $^{18}O$ on the metal–insulator transition temperature of vanadium oxides and magnetite**
By M. WOLF, W. REICHELT, H.-P. BRÜCKNER and H. OPPERMANN .... 373

**The Anderson–Mott transition in positive muon diffusion. Determination of a critical index**
By T. LUKES ..... 377

**Book reviews** ..... 381

NUMBER 3—MARCH

PART A

**Special Issue. David Tabor Festschrift**

**Editorial** ..... 503

**Foreword** ..... 505

**Appreciations** ..... 507

**Friction and wear of organic solids and the adhesion model of friction**
By B. J. BRISCOE ..... 511

**Scratch and indentation hardness of crystals**
By C. A. BROOKES ..... 529

**The effect of lead on the friction and machining of brass**
By N. GANE ..... 545

**Lubrication in metal cutting and grinding**
By G. W. ROWE ..... 567

**The friction of diamond**
By M. SEAL ..... 587

**Strength and fracture properties of diamond**
By J. E. FIELD and C. J. FREEMAN ..... 595

**Dynamic mechanical loss properties of wood**
By D. ATACK ..... 619

**Surfaces produced by guillotining**
By A. G. ATKINS ..... 627

**Dynamic hardness, deformation and fracture of simple ionic crystals at very high rates of strain**
By M. M. CHAUDHRI, J. K. WELLS and A. STEPHENS ..... 643

**The plasticity of polycrystalline ice**
By D. J. GOODMAN, H. J. FROST and M. F. ASHBY ..... 665

**The mechanics of adhesion of viscoelastic solids**
By J. A. GREENWOOD and K. L. JOHNSON ..... 697

PAGE

**Interfacial dislocations in tough adhesive composites**
By K. KENDALL ..... 713

**The effect of oxygen on the adhesion of clean metal surfaces**
By J. B. PETHICA ..... 731

**The use of wetting behaviour at an oil–water interface to study changes in a polymer surface**
By H. J. CHMIELEWSKI and A. I. BAILEY ..... 739

**The forces between surfaces**
By J. N. ISRAELACHVILI ..... 753

**Translational diffusion in entangled polyethylene melts**
By J. KLEIN ..... 771

**Low-energy electron diffraction as a surface probe**
By L. J. CLARKE ..... 779

**The simulation of FIM desorption patterns**
By A. J. W. MOORE ..... 803

**Photoelectron spectroscopy of the iron borides. Structure, bonding and magnetic behaviour**
By D. J. JOYNER and R. F. WILLIS ..... 815

**The use of electron optics in studying surfaces. A summary of an area of David Tabor's work**
By A. E. LEE ..... 835

PART B

**A structural model for $B_2O_3$ glass**
By R. J. BELL and A. CARNEVALE ..... 389

**Transit-pulse dispersion in a spatially random hopping system**
By J. M. MARSHALL ..... 401

**The lifetime of injected carriers in amorphous silicon p–n junctions**
By A. J. SNELL, W. E. SPEAR and P. G. LE COMBER ..... 407

**Implantation damage in amorphous silicon**
By G. MÜLLER and P. G. LE COMBER ..... 419

**A model for the electronic transport in hydrogenated amorphous silicon**
By H. OVERHOF and W. BEYER ..... 433

**Structural investigation of hydrogenated amorphous silicon by X-ray diffraction**
By W. SCHÜLKE ..... 451

**Pressure dependence of the electrical conductivity of amorphous red phosphorus**
By P. EXTANCE and S. R. ELLIOTT ..... 469

**Pressure dependence of the electrical properties of amorphous phosphorus prepared by chemical transport in a low-pressure hydrogen plasma**
By P. EXTANCE and S. R. ELLIOTT ..... 485

**The electronic structure of model lead glasses**
By J. ROBERTSON ..... 497

PAGE

**The temperature dependence of the d.c. conductivity near the Anderson transition in three-dimensional systems**
By D. Belitz and W. Götze ..... 517

**Preparation and properties of amorphous phosphorus nitride prepared in a low-pressure plasma**
By S. Vepřek, Z. Iqbal, J. Brunner and M. Schärli ..... 527

**Local symmetry and chemical characteristics of the arsenic site in arsenic-containing glasses**
By J. Szeftel ..... 549

**Book reviews** ..... 575

## NUMBER 4—APRIL

## PART A

**Dynamic studies of metal oxide catalysts: $MoO_3$**
By P. L. Gai ..... 841

**The mechanism for craze-tip advance in glassy polymers**
By A. M. Donald and E. J. Kramer ..... 857

**A Monte Carlo study of diffusion in a model of an ordered adsorbate**
By G. E. Murch ..... 871

**The atomic structure of dislocations in h.c.p. metals. I. Potentials and unstressed crystals**
By D. J. Bacon and J. W. Martin ..... 883

**The atomic structure of dislocations in h.c.p. metals. II. Behaviour of the core under an applied stress**
By D. J. Bacon and J. W. Martin ..... 901

**Correlation factors for diffusion in dilute interstitial solid solutions**
By A. D. Le Claire ..... 911

**Positron-annihilation studies of deformation of single crystals of Al–4 wt. % Cu**
By S. Panchanadeeswaran and J. G. Byrne ..... 921

**Determination of the spinodal temperature in a series of Al–Zn (6–21 at. %) alloys**
By T. Ungár, J. Lendvai and I. Kovács ..... 927

**A double-line image of a dislocation in a silicon single crystal observed by X-ray plane wave topography**
By K. Ishida, A. Ootuka and S. Takagi ..... 935

**Distinguishing dissociated glide and shuffle set dislocations by high resolution electron microscopy**
By A. Olsen and J. C. H. Spence ..... 945

**Force–displacement curve for dislocations in potassium chloride**
By W. H. Robinson ..... 967

PAGE

**The diffusion of $^{63}Ni$ along grain boundaries in nickel oxide**
By A. ATKINSON and R. I. TAYLOR ..... 979

**Heavy-ion irradiation of nickel and nickel alloys**
By T. M. ROBINSON and M. L. JENKINS ..... 999

**The core structure of $\frac{1}{3}\langle\bar{1}\bar{1}23\rangle\{11\bar{2}2\}$ edge dislocations in h.c.p. metals**
By Y. MINONISHI, S. ISHIOKA, M. KOIWA, S. MOROZUMI and M. YAMAGUCHI ..... 1017

**Planar faults in the $Ll_2$ lattice. Stability and structure**
By M. YAMAGUCHI, V. VITEK and D. P. POPE ..... 1027

**$\langle 011\rangle$ tilt boundaries in the diamond cubic lattice**
By H.-J. MÖLLER ..... 1045

**Correspondence:**
**A note on the influence of hydrostatic pressure on dislocations**
By J. JUNG ..... 1057

PART B

**A theoretical study of defects in amorphous arsenic**
By E. P. O'REILLY ..... 579

**Calculations of off-centre displacements of divalent substitutional ions in CaO, SrO and BaO from model potentials**
By M. J. L. SANGSTER and A. M. STONEHAM ..... 597

**Multiple charge-states of transition metal impurities**
By A. M. STONEHAM and M. J. L. SANGSTER ..... 609

**Transport properties, magnetic susceptibility and Mössbauer spectroscopy of $Fe_{0.25}NbS_2$ and $Fe_{0.33}NbS_2$**
By O. GOROCHOV, A. LE BLANC-SOREAU, J. ROUXEL, P. IMBERT and G. JEHANNO ..... 621

**The structure of the incommensurate superlattices of 2H-$TaSe_2$**
By R. L. WITHERS and L. A. BURSILL ..... 635

**A structural model for the interface between amorphous and (100) crystalline silicon**
By T. SAITO and I. OHDOMARI ..... 673

**Surface characterization of uranium metal and uranium dioxide using X-ray photoelectron spectroscopy**
By G. C. ALLEN, I. R. TRICKLE and P. M. TUCKER ..... 689

**Vibrational entropies of defects in solids**
By J. H. HARDING and A. M. STONEHAM ..... 705

**Electron-irradiation studies of p–n junctions in silicon bipolar transistors**
By L. M. BROWN and D. FATHY ..... 715

**Book reviews** ..... 733

## NUMBER 5—MAY

### PART A

PAGE

**Combined FIM/TEM determination of the structure of an incoherent twin boundary in tungsten**
By P. A. Beaven, D. A. Smith, M. K. Miller and G. D. W. Smith .. 1063

**The self-diffusion of Ni in undoped and Al-doped NiO single crystals**
By A. Atkinson, A. E. Hughes and A. Hammou ..... 1071

**Determination of the miscibility gap in the Al–Be system by resistivity measurements and X-ray small-angle scattering**
By S. Ceresara, A. Benedetti, G. Cocco and S. Enzo ..... 1093

**Crack tip blunting by dislocation pair creation and separation**
By J. Weertman ..... 1103

**An investigation of the mobility of vacancies and interstitials in a Ag–9 at. % Zn alloy by means of high-voltage electron microscopy**
By M. Halbwachs and N. Yoshida ..... 1125

**The contribution of pyramidal forest dislocations to the hardening of zinc single crystals**
By J. P. Michel and G. Champier ..... 1139

**Unusual lattice parameters in two-phase systems after annealing**
By E. J. Mittemeijer, P. van Mourik and Th. H. de Keijser ..... 1157

**Periodic displacement and stress fields near a phase boundary in the isotropic elasticity theory**
By R. Bonnet ..... 1165

**Low-temperature isotope effect of hydrogen diffusion in f.c.c. metals and alloys**
By B. Hohler and H. Kronmüller ..... 1189

**Measurement of the impurity diffusion of In in Ni single crystals by secondary-ion mass spectrometry (SIMS)**
By W. Gust, M. B. Hintz, A. Lodding and H. Odelius ..... 1205

**The energy spectrum of sputtered atoms II**
By M. M. R. Williams ..... 1221

**Observation of [110] tilt boundary structures in gold by high resolution HVEM**
By H. Ichinose and Y. Ishida ..... 1253

**Planar faults and dislocation dissociations in body-centred-cubic-derivative ordered structures**
By M. Yamaguchi, D. Pope, V. Vitek and Y. Umakoshi ..... 1265

**Cathodoluminescence evidence of dislocation interactions in diamond**
By N. Sumida and A. R. Lang ..... 1277

**On the mobility of dislocations in silicon by *in situ* straining in a high-voltage electron microscope**
By F. Louchet ..... 1289

**Formation of gallium interstitials during zinc diffusion into gallium arsenide**
By R. K. Ball, P. W. Hutchinson and P. S. Dobson ..... 1299

## PART B

PAGE

**An asymmetric double-well potential model for structural relaxation processes in amorphous materials**
By K. S. GILROY and W. A. PHILLIPS ..... 735

**OH in vitreous silica. An atomic tunnelling state**
By W. A. PHILLIPS ..... 747

**Pinning of magnetic domain walls at dislocations and precipitates in $Co_5Sm$ crystals**
By J. FIDLER, H. KIRCHMAYR and P. SKALICKY ..... 765

**Photoconductivity studies of the mobility edge in amorphous silicon**
By W. E. SPEAR, H. AL-ANI and P. G. LE COMBER ..... 781

**Theory of electrical conduction in particulate systems**
By D. P. H. SMITH and J. C. ANDERSON ..... 797

**Electrical conduction in particulate thick films**
By D. P. H. SMITH and J. C. ANDERSON ..... 811

**On the theory of a.c. conduction in amorphous semiconductors and chalcogenide glasses**
By A. L. EFROS ..... 829

**Structure and energy level calculations of dislocations in gallium arsenide**
By R. JONES, S. ÖBERG and S. MARKLUND ..... 839

**Antiferromagnetic *S*-domains in NiO. I. Neutron magnetic topographic investigation**
By J. BARUCHEL, M. SCHLENKER, K. KUROSAWA and S. SAITO ..... 853

**Antiferromagnetic *S*-domains in NiO. II. Effect of crystallographic twinning on the visibility of domains by X-ray topography**
By J. BARUCHEL, M. SCHLENKER, K. KUROSAWA and S. SAITO ..... 861

**Calculation of the interaction energy between a self-interstitial and a (1/2)⟨111⟩ screw dislocation in b.c.c. transition metals. Moments approach**
By K. MASUDA, Y. SUGANO and A. SATO ..... 869

**A high-resolution study of the electrical resistivity of thin noble-metal foils**
By A. D. CAPLIN, M. N. DALIMIN and S. SENOUSSI ..... 881

**Magnetic ordering in strained chromium**
By I. S. WILLIAMS and R. STREET ..... 893

**Ultra-high-resolution electron microscopy of amorphous materials at 120 kV**
By D. J. SMITH, W. M. STOBBS and W. O. SAXTON ..... 907

**Correspondence:**

**The interatomic potential and the long-range $S(k)$ in liquids**
By C. C. MATTHAI ..... 925

**Anisotropy in the Compton profile of vanadium**
By A. ROLLASON, M. COOPER, R. S. HOLT, I. BAILEY and T. J. L. JONES 931

**Thermodynamic evidence of clustering in liquid Ga–Te alloys**
By S. F. JOHNSTON ..... 937

**The random-phase model in non-crystalline systems**
By N. F. MOTT ..... 941

**Trap-controlled hopping in a system with a Gaussian distribution of the energy of hopping sites**
By M. SILVER, G. SCHÖNHERR and H. BÄSSLER ..... 943

**Book reviews** ..... 949

## NUMBER 6—JUNE

### PART A

PAGE

**Asymptotic form of activation energy for double-kink formation in a dislocation in a one-dimensional periodic field**
By T. Mori and M. Kato ..... 1315

**A theory of peaks in the time-of-flight spectrum of gold atoms sputtered from a (100) surface**
By M. W. Finnis ..... 1321

**The nature of special-mode softening and the mechanism of martensitic phase transition in $\beta$-phase alloys**
By A. Nagasawa, N. Nakanishi and K. Enami ..... 1345

**The precipitation of the cubic Suzuki phase in NaCl:$Cd^{2+}$ and NaCl:$Mg^{2+}$**
By A. L. Guerrero, E. P. Butler, P. L. Pratt and L. W. Hobbs .... 1359

**Slip systems in a body-centred-cubic Li–Mg alloy**
By H. Saka and G. Taylor ..... 1377

**Self-energy and self-force of dislocations**
By H. O. K. Kirchner ..... 1393

**On the analysis of diffusion anomalies in Ti alloys**
By J. M. Sanchez ..... 1407

**The spatial distribution of self-interstitial atoms around depleted zones in tungsten ion-irradiated at 10 K**
By C.-Y. Wei and D. N. Seidman ..... 1419

**The secondary transmission of energy in collision sequences**
By V. V. Kirsanov ..... 1441

**The pressure dependence of elastic constants and bond bending in HgTe**
By A. J. Miller, G. A. Saunders, Y. K. Yoğurtçu and A. E. Abey 1447

**The calculation of defect energies in the perovskite fluoride $KMnF_3$**
By J. A. Kilner ..... 1473

**Morphology and crystallography of the isothermal martensite transformation in Fe–Ni–Mn alloys**
By S. Kajiwara ..... 1483

**New stages in stress–strain curves of germanium at high temperatures**
By H. G. Brion, H. Siethoff and W. Schröter ..... 1505

**Melting phenomenon and properties of defects associated with pulsed laser irradiation**
By J. Narayan and C. W. White ..... 1515

**Optimized tensile conditions for the *in situ* X-ray topographic observation of glide dislocations in single crystals**
By C. G'Sell and G. Champier ..... 1537

**Grain boundary diffusional creep of materials containing particles**
By B. Burton and W. B. Beeré ..... 1561

**On producing high-spatial-resolution composition profiles via scanning transmission electron microscopy**
By E. L. Hall, D. Imeson and J. B. Vander Sande ..... 1569

**Correspondence:**

**The effect of specimen thickness on X-ray profiles in STEM**
By M. E. Twigg, M. H. Loretto and H. L. Fraser ..... 1587

**Cross-slip characterization in spinel $MgO.1{\cdot}8Al_2O_3$ deformed at high temperatures**
By R. Duclos, N. Doukhan and B. Escaig ..... 1595

PAGE

**Phénomènes métallurgiques observés après irradiation au laser de l'alliage ordonné $Ni_3Fe$**
Par M. F. RICHARD, J. P. EYMERY et H. GAREM ..... 1601

**Subject index** ..... 1607

**Index of authors (with titles)** ..... 1615

PART B

**The effect of tensile stress on the Néel temperature in chromium**
By I. S. WILLIAMS and R. STREET ..... 955

**Transmission spectra of lithium intercalation complexes of some layered transition-metal dichalcogenides. I. Group-IVA octahedral coordination**
By A. R. BEAL and S. NULSEN ..... 965

**Transmission spectra of lithium intercalation complexes of some layered transition-metal dichalcogenides. II. Group VA: trigonal prismatic coordination**
By A. R. BEAL and S. NULSEN ..... 985

**Compton profiles of 3d transition metals**
By K. R. KRISHNA GANDHI and R. M. SINGRU ..... 999

**Low-temperature specific heats of α-phase alloys based on copper**
By M. D. TIWARI, P. N. RAM and V. K. MANCHANDA ..... 1005

**The theory of anomalous carrier pulse propagation in amorphous semiconductors. II. Extension to later phases in the life of the pulse**
By J. D. CLARK and P. N. BUTCHER ..... 1017

**The theory of anomalous carrier pulse propagation in amorphous semiconductors. III. Derivation of a macroscopic conservation equation for carriers hopping on a lattice of sites with random positions and energies**
By P. N. BUTCHER and J. D. CLARK ..... 1029

**Thermal expansion of amorphous $As_2S_3$ at low temperatures**
By G. J. MORGAN, G. K. WHITE and J. G. COLLINS ..... 1039

**Higher order elasticity of amorphous $As_2S_3$**
By M. P. BRASSINGTON, A. J. MILLER and G. A. SAUNDERS ..... 1049

**Photoinduced absorption in Se–Ge glasses**
By A. J. MOSELEY and J. M. CHAMBERLAIN ..... 1065

**Electrophotographic studies of glow-discharge amorphous silicon**
By S. ODA, Y. SAITO, I. SHIMIZU and E. INOUE ..... 1079

**Oxidation and interface states in a-Si:H**
By R. A. STREET and J. C. KNIGHTS ..... 1091

**Structure of molten alkali chlorides. I. A molecular dynamics study**
By M. DIXON and M. J. GILLAN ..... 1099

**Structure of molten alkali chlorides. II. Semi-analytic methods**
By G. M. ABERNETHY, M. DIXON and M. J. GILLAN ..... 1113

**The absolute scale of thermoelectricity II**
By R. B. ROBERTS ..... 1125

**Subject index** ..... 1137

**Index of authors (with titles)** ..... 1145